



## **DEPARTMENT OF TRANSPORTATION**

### **Federal Aviation Administration**

#### **14 CFR Part 39**

**[Docket No. FAA-2021-0381; Project Identifier MCAI-2020-01656-E]**

**RIN 2120-AA64**

#### **Airworthiness Directives; Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc) Turbofan Engines**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of proposed rulemaking (NPRM).

**SUMMARY:** The FAA proposes to adopt a new airworthiness directive (AD) for certain Rolls-Royce Deutschland Ltd & Co KG (RRD) Trent XWB-75, Trent XWB-79, Trent XWB-79B, and Trent XWB-84 model turbofan engines. This proposed AD was prompted by reports of cracks in the intermediate-pressure compressor (IPC) rotor 1 (R1) blades installed on certain Trent XWB model turbofan engines. This proposed AD would require initial and repetitive borescope inspections (BSIs) of the affected IPC R1 blades and, depending on the results of the inspections, replacement of all 34 IPC R1 blades.

The FAA is proposing this AD to address the unsafe condition on these products.

**DATES:** The FAA must receive comments on this proposed AD by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- Federal eRulemaking Portal: Go to <https://www.regulations.gov>. Follow the instructions for submitting comments.
- Fax: (202) 493-2251.
- Mail: U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12 140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- Hand Delivery: Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For service information identified in this NPRM, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; fax: +44 (0)1332 249936; email: <https://www.rolls-royce.com/contact-us/civil-aerospace.aspx>; website: <https://www.rolls-royce.com/contact-us.aspx>. You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

### **Examining the AD Docket**

You may examine the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0381; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The street address for Docket Operations is listed above.

**FOR FURTHER INFORMATION CONTACT:** Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: [kevin.m.clark@faa.gov](mailto:kevin.m.clark@faa.gov).

### **SUPPLEMENTARY INFORMATION:**

#### **Comments Invited**

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under the ADDRESSES section. Include “Docket No. FAA-2021-0381; Project Identifier MCAI-2020-01656-E” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this NPRM because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all

comments received, without change, to <https://www.regulations.gov>, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

### **Confidential Business Information**

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Kevin Clark, Aviation Safety Engineer, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

### **Background**

The European Union Aviation Safety Agency (EASA), which is the Technical Agent for the Member States of the European Community, has issued EASA AD 2020-0277, dated December 11, 2020 (referred to after this as “the MCAI”), to address the unsafe condition on these products. The MCAI states:

Occurrences have been reported of finding cracked IPC R1 blades on certain Trent XWB engines that were close to their first planned refurbishment shop visit.

This condition, if not corrected, could lead to blade failure and consequent engine in-flight shut-down (IFSD), possibly resulting in reduced control of the aeroplane.

To address this potential unsafe condition and avoid dual engine IFSD, Rolls-Royce issued the inspection NMSB to provide

inspection instructions and the NMSB to provide information on threshold and intervals.

For the reasons described above, this [EASA] AD requires repetitive inspections of the affected parts and, depending on findings, accomplishment of applicable corrective action(s).

You may obtain further information by examining the MCAI in the AD docket at <https://www.regulations.gov> by searching for and locating Docket No. FAA-2021-0381.

#### **FAA's Determination**

This product has been approved by EASA and is approved for operation in the United States. Pursuant to the FAA's bilateral agreement with the European Community, EASA has notified the FAA of the unsafe condition described in the MCAI and service information. The FAA is issuing this NPRM because the agency evaluated all the relevant information provided by EASA and determined the unsafe condition described previously is likely to exist or develop in other products of the same type design.

#### **Related Service Information under 1 CFR Part 51**

The FAA reviewed Rolls-Royce Non-Modification Service Bulletin (NMSB) Trent XWB 72-K633, Initial Issue, dated August 7, 2020. This service information specifies procedures for performing initial and repetitive BSIs of the Trent XWB-75, XWB-79, XWB-79B, and XWB-84 IPC R1 blades. This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

#### **Other Related Service Information**

The FAA reviewed Rolls-Royce Alert NMSB Trent XWB 72-AK612, Initial Issue, dated July 9, 2020; Rolls-Royce Alert NMSB Trent XWB 72-AK613, Initial Issue, dated July 17, 2020; and Rolls-Royce Alert NMSB Trent XWB 72-AK632, Initial Issue, dated August 7, 2020.

Rolls-Royce Alert NMSB Trent XWB 72-AK612 describes procedures for performing a BSI of the Trent XWB-84 IPC R1 blades. Rolls-Royce Alert NMSB Trent XWB 72-AK613 describes procedures for performing a BSI of the Trent XWB-75, XWB-79, XWB-79B, and XWB-84 IPC R1 blades. Rolls-Royce Alert NMSB Trent

XWB 72-AK632 defines the initial inspection threshold and repeat inspection intervals for Trent XWB-75, XWB-79, XWB-79B, and XWB-84 IPC R1 blades.

### **Proposed AD Requirements in this NPRM**

This proposed AD would require initial and repetitive BSIs of the affected IPC R1 blades and, depending on the results of the inspections, replacement of all 34 IPC R1 blades with parts eligible for installation.

### **Differences Between this Proposed AD and the MCAI or Service Information**

EASA AD 2020-0277, dated December 11, 2020, and Rolls-Royce NMSB Trent XWB 72-K633, Initial Issue, dated August 7, 2020, instruct operators to contact and provide information to Rolls-Royce if any IPC R1 blade is found cracked during the inspection, while this proposed AD requires operators to remove and replace all 34 IPC R1 blades if a crack is found during the inspection.

### **Costs of Compliance**

The FAA estimates that this AD, if adopted as proposed, would affect 15 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this proposed AD:

#### **Estimated costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>	<b>Cost on U.S. operators</b>
BSI affected IPC R1 blades	6 work-hours x \$85 per hour = \$510	\$0	\$510	\$7,650

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the proposed inspection. The FAA has no way of determining the number of aircraft that might need this replacement.

#### **On-condition costs**

<b>Action</b>	<b>Labor Cost</b>	<b>Parts Cost</b>	<b>Cost per product</b>
Replace all 34 IPC R1 blades	100 work-hours x \$85 per hour = \$8,500	\$187,408	\$195,908

## **Authority for This Rulemaking**

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

## **Regulatory Findings**

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

## **List of Subjects in 14 CFR Part 39**

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

## **The Proposed Amendment**

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

### **PART 39 - AIRWORTHINESS DIRECTIVES**

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

**§ 39.13 [Amended]**

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

**Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc):** Docket No. FAA-2021-0381; Project Identifier MCAI-2020-01656-E.

**(a) Comments Due Date**

The FAA must receive comments on this airworthiness directive (AD) by [INSERT DATE 45 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**(b) Affected ADs**

None.

**(c) Applicability**

This AD applies to Rolls-Royce Deutschland Ltd & Co KG (Type Certificate previously held by Rolls-Royce plc) Trent XWB-75, Trent XWB-79, Trent XWB-79B, and Trent XWB-84 model turbofan engines with an installed intermediate-pressure compressor (IPC) rotor 1 (R1) blade, part number (P/N) KH21559.

**(d) Subject**

Joint Aircraft System Component (JASC) Code 7230, Turbine Engine Compressor Section.

**(e) Unsafe Condition**

This AD was prompted by reports of cracks in the IPC R1 blades installed on certain Trent XWB model turbofan engines. The FAA is issuing this AD to prevent failure of the IPC R1 blades. The unsafe condition, if not addressed, could result in failure of the engine, in-flight shutdown of the engine, and loss of the airplane.

**(f) Compliance**

Comply with this AD within the compliance times specified, unless already done.

**(g) Required Actions**

(1) Within the compliance time specified in Figure 1 to paragraph (g)(1) of this AD, perform an initial borescope inspection (BSI) of the affected IPC R1 blades using the Accomplishment Instructions, paragraphs 3.A.(3)(b) and (c) (on-wing) or 3.B.(2)(b)

and (c) (in-shop), as applicable, of Rolls-Royce Non-Modification Service Bulletin Trent XWB 72-K633, Initial Issue, dated August 7, 2020.

**Figure 1 to Paragraph (g)(1) – Inspection threshold**

<b>Flight cycles (FCs) since new</b>	<b>Compliance time</b>
Less than 2,300 FCs since new	Before exceeding 2,300 FCs since new, or within 50 FCs after the effective date of this AD, whichever occurs later
2,300 or more FCs since new	Within 50 FCs after the effective date of this AD

(2) Thereafter, repeat the BSI of the affected IPC R1 blades required by paragraph (g)(1) of this AD before exceeding 200 engine FCs since the last BSI of the affected IPC R1 blades.

(3) If, during any inspection required by paragraph (g)(1) or (2) of this AD, any affected IPC R1 blade is found cracked, remove all 34 IPC R1 blades from service and replace with parts eligible for installation.

Note 1 to paragraph (g): The FCs specified in Figure 1 to paragraph (g)(1) of this AD are those accumulated by the affected IPC R1 blade having the highest flight cycles in the IPC R1 blade set since the first installation of the affected blade on an engine. When the FCs of the affected IPC R1 blade set cannot be established, use the FCs accumulated by the engine since new.

**(h) Definition**

For the purpose of this AD, a part eligible for installation is any IPC R1 blade having P/N KH21559 with zero engine FCs since new, any IPC R1 blade having P/N KH21559 that has been inspected in accordance with paragraph (g)(1) of this AD and a crack was not found, or any IPC R1 blade having a P/N not listed in this AD.

**(i) Credit for Previous Actions**

You may take credit for the initial BSI required by paragraph (g)(1) of this AD if you performed the initial BSI before the effective date of this AD using Rolls-Royce Alert Non-Modification Service Bulletin (NMSB) Trent XWB 72-AK612, Initial Issue, dated July 9, 2020, or Rolls-Royce Alert NMSB Trent XWB 72-AK613, Initial Issue, dated July 17, 2020, as applicable.



**(j) Alternative Methods of Compliance (AMOCs)**

(1) The Manager, ECO Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the manager of the certification office, send it to the attention of the person identified in Related Information. You may email your request to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

**(k) Related Information**

(1) For more information about this AD, contact Kevin Clark, ECO Branch, FAA, 1200 District Avenue, Burlington, MA 01803; phone: (781) 238-7088; fax: (781) 238-7199; email: kevin.m.clark@faa.gov.

(2) Refer to European Union Aviation Safety Agency (EASA) AD 2020-0277, dated December 11, 2020, for more information. You may examine the EASA AD in the AD docket at <https://www.regulations.gov> by searching for and locating it in Docket No. FAA-2021-0381.

(3) For service information identified in this AD, contact Rolls-Royce plc, Corporate Communications, P.O. Box 31, Derby, DE24 8BJ, United Kingdom; phone: +44 (0)1332 242424; fax: +44 (0)1332 249936; email: <https://www.rolls-royce.com/contact-us/civil-aerospace.aspx>; website: <https://www.rolls-royce.com/contact-us.aspx>. You may view this referenced service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (781) 238-7759.

Issued on May 21, 2021.

Lance T. Gant, Director,  
Compliance & Airworthiness Division,  
Aircraft Certification Service.

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